

CLAIM AMENDMENTS

Claims 1-18 (Canceled).

19. (New) An implant for implantation between a nucleus and an annulus and across a defect in the annulus in an intervertebral disc, comprising:

a barrier having a first and second surface, wherein said first surface is adapted to present a concave surface facing the nucleus in the implanted orientation and wherein said barrier is dimensioned to extend along the annulus across and beyond the periphery of the area defining a defect.

20. (New) The implant of claim 19, wherein said barrier is resilient.

21. (New) The implant of claim 19, wherein said barrier is adapted to contact load bearing annulus tissue sufficient to prevent extrusion of said barrier through said defect.

22. (New) The implant of claim 19, wherein said barrier is adapted to contact load bearing vertebral body endplate tissue sufficient to prevent extrusion of said barrier through said defect.

23. (New) The implant of claim 19, wherein said barrier has a width of at least 1 cm.

24. (New) The implant of claim 19, wherein said barrier has a height of at least 0.05 cm.

25. (New) The implant of claim 19, wherein said second surface is adapted to present a convex surface in conformity with the interior surface of the annulus.

26. (New) The implant of claim 19, wherein said second surface is adapted to present a convex surface in conformity with the endplates.

27. (New) The implant of claim 19, wherein said barrier is adapted to fit between the nucleus

and the annulus.

28. (New) The implant of claim 19, wherein said barrier has a top and bottom edge and a first and second side edge, wherein said top and bottom edge are dimensioned to contact the endplates at maximum distraction.

29. (New) The implant of claim 19, wherein said barrier is dimensioned such that when the barrier is centered in the posterior annulus, the first and second side edges of said barrier lie beyond the posterior annulus and along opposite lateral walls of the annulus.

30. (New) A device for augmenting an annulus of an intervertebral disc suitable for inserting along an interior aspect of an annular lamella substantially in front of a defect in the annulus, comprising:  
a thin resilient barrier having a first surface facing an interior aspect of the annular lamella and a second surface facing the interior of the intervertebral disc, wherein said barrier is adapted to be sealably positioned against the lamella via the exertion of force on the second surface sustained by a pressurized intervertebral disc environment.

31. (New) The device of claim 30, wherein the barrier is adapted to be inserted between the annulus and the nucleus.

32. (New) A device for partially encapsulating inter-annular material comprising resilient flexible material adapted to conform to at least a portion of the interior surface of an annulus fibrosus and of sufficient size and sufficient rigidity to not be extrudable through an annulus defect.

33. (New) An annulus augmentation implant for insertion along the surface of an annular lamella and across a defect in an intervertebral disc, comprising:

a collapseable resilient barrier having a top and bottom edge and a first and second side edge, wherein the top and bottom edge are sized to contact the endplates at maximum distraction; and wherein the first and second edge extend beyond the defect.

34. (New) The device of claim 33, wherein the barrier has a concave cross section along at least a portion of its length.

35. (New) The implant of claim 33, wherein the first edge and the second edge are adapted to extend beyond the posterior anulus when implanted.

36. (New) A device for transferring intervertebral disc pressure from a defect in an anulus fibrosus to load bearing tissue, comprising:

a flexible barrier having a first convex surface and a second concave surface;  
wherein the first convex surface is in communication with a portion of the posterior anulus;  
wherein the second concave surface is in communication with the nucleus pulposus; and  
wherein said barrier is dimensioned to extend beyond the periphery of the area defining the defect such that the barrier contacts load bearing intervertebral disc tissue.

37. (New) A dynamically stable device for shielding defects in an anulus fibrosus of an intervertebral disc, comprising:

a flexible membrane adapted to yield to interdiscal pressure and conform to at least a portion of the posterior anulus under both distraction and compression of the disc, wherein said membrane is sized to extend along the interior of The posterior anulus.

38. (New) The device of claim 37, wherein the device has a width in a lateral direction and a height in an inferior-superior direction, wherein the height exceeds the distance between an inferior vertebral body and a superior vertebral body when fully distracted so that the device is concave inwardly along an inferior superior axis in the implanted orientation.

39. (New) A method of closing off a defect in an anulus of an intervertebral disc, said intervertebral disc being part of a spine, including the steps of:

inserting a barrier through an opening into a disc; and  
positioning said barrier between native nucleus tissue and an interior surface of a anulus lamella

such that said barrier spans beyond the periphery of said defect in more than one direction.

40. (New) The method of claim 39 wherein said opening is spacially separated from said defect.

41. (New) The method of claim 39 wherein the barrier comprises a frame and a membrane; and further comprising the steps of positioning said barrier proximate to said defect; and expanding said barrier such that said barrier obstructs passage of material from the interior of said disc into said defect.

41. (New) The method of claim 39 wherein said annulus has multiple layers, said method comprising the steps of:

inserting a first portion of the barrier between at least two layers of said annulus on a first side of said defect; and

inserting a second portion of said barrier between at least two layers of said annulus fibrosis on a second side of said defect, such that said barrier spans said defect and is maintained in position at least in part by the annulus fibrosis on each side of said defect, said barrier acting to obstruct passage of material from the interior of said disc to the exterior of said disc through said defect.

42. (New) The method of claim 39, wherein the opening is through the defect.

43. (New) The method of claim 39, further comprising the step of inserting biocompatible material into the interior of the disc to aid in restoring disc height.

44. (New) The method of claim 43, wherein the material comprises a fibrous material including collagen or cellulous.

45. (New) The method of claim 43, wherein the material comprises a hydrogel.

46. (New) The method of claim 39, wherein the barrier comprises a frame and a membrane.

47. (New) The method of claim 46, wherein the membrane covers at least a portion of the frame.

48. (New) The method of claim 46, wherein the membrane has a thickness in a range between 0.025 mm and 2.5 mm.

49. (New) The method of claim 46, wherein the membrane comprises a material selected from the group consisting of synthetic polyamide, synthetic polyester, polyethylene, collagen, PTFE and e-PTFE.

50. (New) The method of claim 39, wherein the barrier has concavity such that upon implantation into the disc the concavity is directed toward the interior of the disc.

51. (New) The method of claim 50, wherein the barrier comprises a frame that elastically changes from a compressed state to an expanded state upon insertion into the disc.

52. (New) The method of claim 39, wherein the barrier further comprises a plurality of pores, the pores having an average size in a range from 0.05 mm.sup.2 and 0.75 mm.sup.2.

53. (New) The method of claim 52, wherein the barrier comprises a frame having a thickness in a range between 0.1 mm and 0.6 mm.

54. (New) The method of claim 39, wherein the barrier comprises a frame that comprises a material selected from the group consisting of nickel and titanium, stainless steel, cobalt, chrome, titanium, polyethylene, and silicone rubber.

56. (New) A method of obstructing a defect in an annulus of an intervertebral disc, said intervertebral disc being part of a spine and including a native nucleus tissue comprising the steps of: inserting a barrier through an opening into the disc; and positioning a first portion of the barrier between the native nucleus tissue and the defect, and a

second portion of the barrier between the native nucleus tissue and an interior surface of an annulus lamella adjacent to the defect such that said barrier spans beyond the periphery of said defect in more than one direction.

57. (New) A method of obstructing a defect in an annulus of an intervertebral disc as in claim 56, wherein the opening is the defect.

58. (New) A method of obstructing a defect in an annulus of an intervertebral disc as in claim 56, wherein the opening is spaced apart from the defect.

59. (New) A method of inserting a membrane into an intervertebral disc to obstruct a defect in an annulus fibrosus, comprising the steps of:

providing a membrane on an insertion device;

inserting the insertion device through an opening in the annulus fibrosus and into the intervertebral disc; and

deploying the membrane within the intervertebral disc to obstruct the defect, wherein said membrane is positioned between a native nucleus tissue and an interior surface of an annulus lamella substantially in front of said defect such that said membrane spans beyond the periphery of said defect.

60. (New) The method of claim 59 further comprising affixing the membrane to tissue in or surrounding the intervertebral disc.

61. (New) The method of claim 59 further comprising expanding the membrane from a reduced state for the insertion step to an expanded state to occlude the defect.

62. (New) The method of claim 59 further comprising removing the insertion device from the intervertebral disc.

63. (New) The method of claim 59 wherein the inserting step comprises inserting the insertion

device into the intervertebral disc at a point located a distance away from the defect in the annular fibrosis of the intervertebral disc and advancing the membrane across the defect.

64. (New) The method of claim 59 wherein the providing step further comprises providing a frame on which the membrane is mounted.

65. (New) The method of claim 64 wherein the providing step comprises providing a frame including an alloy of nickel and titanium.

66. (New) The method of claim 64 wherein the providing step further comprises providing a frame including a longitudinal strut and a plurality of radial elements.

67. (New) A method of inserting a membrane into an intervertebral disc, comprising:  
providing a membrane on an insertion device;  
inserting the insertion device into the intervertebral disc along a first axis; and  
deploying the membrane laterally from the insertion device within the intervertebral disc between the nucleus pulposus and the annulus fibrosis along a second axis which is transverse to the first axis.

68. (New) The method of claim 67 further comprising affixing the membrane to tissue in or surrounding the intervertebral disc.

69. (New) The method of claim 67 further comprising expanding the membrane to an expanded state.

70. (New) The method of claim 67 further comprising removing the insertion device from the intervertebral disc.

71. (New) The method of claim 67 further comprising inserting the insertion device into the

intervertebral disc at a point located a distance away from a defect in the annular fibrosis of the intervertebral disc and advancing the membrane across the defect.

72. (New) The method of claim 67 further comprising providing a frame on which the membrane is mounted.

73. (New) The method of claim 67 further comprising providing a frame including an alloy of nickel and titanium.

74. (New) The method of claim 67 further comprising providing a frame including a longitudinal strut and a plurality of radial elements.

75. (New) The method of claim 67 further comprising providing a frame with a first end and a second end that extend at oblique angles relative to a longitudinal axis of the frame.

76. (New) A method of inserting a membrane into an intervertebral disc, comprising:  
providing a membrane on an insertion device;  
inserting the insertion device into the intervertebral disc along a first axis, at a point located a distance away from a defect in the annulus fibrosis of the intervertebral disc and advancing the membrane across the defect; and  
deploying the membrane laterally from the insertion device within the intervertebral disc along a second axis which is transverse to the first axis.

77. (New) The method of claim 76 further comprising affixing the membrane to tissue in surrounding the intervertebral disc.

78. (New) The method of claim 76 further comprising deploying the membrane between the nucleus pulposus and the annulus fibrosis of the intervertebral disc.



79. (New) The method of claim 76 further comprising expanding the membrane to an expanded state.

80. (New) The method of claim 76 further comprising removing the insertion device from the intervertebral disc.

81. (New) The method of claim 76 further comprising providing a frame on which the membrane is mounted.

82. (New) The method of claim 76 further comprising providing a frame including an alloy of nickel and titanium.

83. (New) The method of claim 76 further comprising providing a frame including a longitudinal strut and a plurality of radial elements.

84. (New) The method of claim 76 further comprising providing a frame with a first end and a second end that extend at oblique angles relative to a longitudinal axis of the frame.